I. *A new Method for making* Logarithms, *and* vice versâ, *for finding the Number corresponding to a* Logarithm *given, by help of the following Table.* Communicated by *Mr.* John Long, S. Theol. Bacc. *and Fellow of* Corpus Christi Coll. Oxon.

Log.	Nat. Num.	Log.	Nat. Num.
0,9	7.943282347	0,0009	1.002074475
0,8	6.309573445	0,0008	1.001843766
0,7	5.011872336	0,0007	1.001613109
0,6	3.981071706	0,0006	1.001382506
0,5	3.162277660	0,0005	1.001151956
0,4	2.511886432	0,0004	1.000921459
0,3	1.995262315	0,0003	1.000691015
0,2	1.584893193	0,0002	1.000460623
0,1	1.258925412	0,0001	1.000230285
0,09	1.230268771	0,00009	1.000207254
0,08	1.202264435	0,00008	1.000184224
0,07	1.174897555	0,00007	1.000161194
0,06	1.148153621	0,00006	1.000138165
0,05	1.122018454	0,00005	1.000115136
0,04	1.096478196	0,00004	1.000092106
0,03	1.071519305	0,00003	1.000069080
0,02	1.047128548	0,00002	1.000046053
0,01	1.023292992	0,00001	1.000023026
0,009	1.020939484	0,000009	1.000020724
0,008	1.018591388	0,000008	1.000018421
0,007	1.016248694	0,000007	1.000016118
0,006	1.013911386	0,000006	1.000013816
0,005	1.011579454	0,000005	1.000011513
0,004	1.009252886	0,000004	1.000009210
0,003	1.006931669	0,000003	1.000006908
0,002	1.004615794	0,000002	1.000004605
0,001	1.002305238	0,000001	1.000002302

Log.	Nat. Num.	Log.	Nat. Num.
0,0000009	1.000002072	0,00000009	1 000000207
0,0000008	1.000001842	0,00000008	1.000000184
0,0000007	1.000001611	0,00000007	1.000000161
0,0000006	1.000001381	0,00000006	1.000000138
0,0000005	1.000001151	0,00000005	1,000000115
0,0000004	1.000000921	0,00000004	1.000000092
0,0000003	1.000000690	0,00000003	1.000000069
0,0000002	1.000000460	0,00000002	1.000000046
0,0000001	1 000000230	0.00000001	1.000000023

This Table is what I fometimes make ufe of for finding the Logarithm of any Number propos'd, and *vice versâ*. For in-ftance: Suppofe I had occafion to find the Logarithm of 2000. I look in the firft Clafs of my Table (the whole Table confifts of 8 Claffes) for the next lefs to 2, which is 1.995262315, and againft it is 3, which confequently is the firft Figure of the Lo-garithm fought. Again; dividing the Number propos'd 2, by 1.995262315 the Number found in the Table, the Quotient is 1.002374467; which being look'd for in the fecond Clafs of the Table, and finding neither its equal, nor a leffer, I add 0 to the part of the Logarithm before found, and look for the faid Quotient 1.002374467 in the third Clafs, where the next lefs is 1.002305238, and againft it is 1, to be added to the part of the Logarithm already found; and dividing the Quoti-ent 1.002374467, by 1.002305238, laft found in the Table, the Quotient is 1.000069070; which being fought in the fourth Clafs gives 0, but being fought in the fifth Clafs gives 2, to be added to the part of the Logarithm already found; and dividing the laft Quotient by the Number laft found in the Ta-ble, *viz.* 1.000046053, the Quotient is 1.000023015, which being fought in the fixth Clafs, gives 9 to the part of the Loga-rithm already found: And dividing the laft Quotient by the new Divifor, *viz.* 1.000002072, the Quotient is 1 000000219, which being greater than 1.000000115, fhews that the Loga-rithm already found, *viz.* 3.3010299 is lefs than the Truth by

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more than half an Unit ; wherefore adding 1, you have *Briggs's* Logarithm of 2000, *viz.* 3.3010300.

If any Logarithm be given, suppose 3.3010300, throw away the Characteristic, then over against these Figures 3 ... 0 .. 1 ... 0 .. 3 .. 0 .. 0, you have in their respective Classes 1.9952623 15 ..., 0 ..... 1. 002305238 ...... 0 ... ... 1 .000069080 ....0 ...0 which multiplied continually into one another, the Product is 2.000000019966, which by reason the Characteristic is 3, becomes 2000.000019966, *&c.* that is, 2000, the Natural Number desired. I shall not mention the Method by which this Table is fram'd, because you will easily see that from the use of it.

It is obvious to the intelligent Reader, that these Classes of Numbers are no other than so many Scales of mean Proportionals: In the first Class, between 1 and 10; so that the last Number thereof, *viz.* 1,2589254 12 is the tenth Root of 10, and the rest in order ascending are the Powers thereof. So in the second Class, the last Number 1,023292992 is the hundredth Root of 10, and the rest in the same manner are Powers thereof. So 1,002305238 in the third Class, is the tenth Root of the last of the second, and the rest its Powers, *&c.* Or, which is all one, each Number in the preceding Class, is the tenth Power of the corresponding Number in the next following Class: Whence 'tis plain, that to construct these Tables requires no more than one Extraction of the fifth or sursolid Root for each Class, the rest of the Work being done by the common Rules of Arithmetick; and for extracting the fifth Root, you will find more than one very compendious Rule in *Num.* 210 of these *Transactions*, if any one shall desire to examin the *computus* of these Tables.

The Process is exactly the Reverse of Mr. *Briggs's* Doctrine, in *Cap.* XII. of his *Arithmetica Logarithmica* of *Vlacq's* Edition; and had *Briggs* been appriz'd hereof, it would have greatly eased the Labour of deducing the Logarithms of the first prime Numbers, which appear to have cost him so much Pains.